



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

the Application of: **Toshio NARITA et al.**

Group Art Unit: **1762**

Serial No.: **10/509,028**

Filed: **May 16, 2005**

Confirmation No.: **1095**

For: **HEAT-RESISTANT MATERIAL Ti ALLOY MATERIAL
EXCELLENT IN RESISTANCE TO CORROSION AT HIGH-
TEMPERATURE AND TO OXIDATION**

Attorney Docket Number: **042591**

Customer Number: **38834**

REQUEST FOR CORRECTED FILING RECEIPT

Mail Stop: Missing Parts

Commissioner for Patents

P. O. Box 1450

Alexandria, VA 22313-1450

Date: August 10, 2005

Sir:

Please supply the undersigned attorney with a corrected filing receipt for the above-identified application. The undersigned also respectfully requests that the Patent and Trademark Office records be amended to reflect the correction.

In reviewing the Official Filing Receipt, we noted that the Assignee's Information was not recorded and also we noted an error in the Title. The Assignee's Information should read --**JAPAN SCIENCE AND TECHNOLOGY AGENCY, Kawaguchi-shi, JAPAN--** and the Title should read --**HEAT-RESISTANT MATERIAL Ti ALLOY MATERIAL EXCELLENT IN RESISTANCE TO CORROSION AT HIGH TEMPERATURE AND TO OXIDATION--**. A copy of the **Transmittal Letter** and the **PCT Publication** are enclosed which indicate the

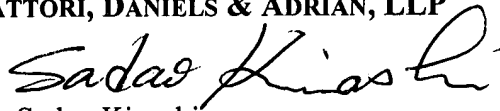
Request for Corrected Filing Receipt
10/509,028
042591

correct information. We are also enclosing a copy of the filing receipt with the corrections highlighted.

In the event any fees are required in connection with this paper, please charge Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

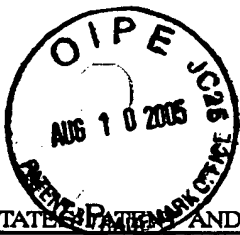
A handwritten signature in black ink, appearing to read "Sadao Kinashi", written in a cursive style.

Sadao Kinashi

Attorney for Applicants
Registration No. 48,075
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

SK/if

Enclosures: Official Filing Receipt; Transmittal Letter; PCT Publication



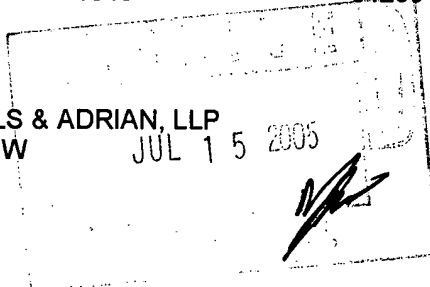
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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/509,028	05/16/2005	1762	1340	042591	5	6	1

38834

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
 1250 CONNECTICUT AVENUE, NW
 SUITE 700
 WASHINGTON, DC 20036



CONFIRMATION NO. 1095

FILING RECEIPT



OC000000016486232

Date Mailed: 07/13/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

Applicant(s)

Toshio Narita, Hokkaido, JAPAN;
 Takumi Nishimoto, Hokkaido, JAPAN;

Please Insert { Assignment for Published Patent Application

-- JAPAN SCIENCE AND TECHNOLOGY AGENCY, Kawaguchi-shi, JAPAN--:
 Power of Attorney: The patent practitioners associated with Customer Number 38834.

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/JP03/03664 03/25/2003

Foreign Applications

JAPAN 2002-087738 03/27/2002

Projected Publication Date: 10/20/2005

Non-Publication Request: No

Early Publication Request: No

Title

Please Insert

~~Material~~

Heat-resistant alloy material excellent in resistance to corrosion at high temperature and to oxidation

↑
 --Ti--

Preliminary Class

427

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15**

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U.S. DEPARTMENT OF COMMERCE, PATENT AND TRADEMARK OFFICE		DATE: September 27, 2004
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. Application No. (if known) AUG 10 2005
INTERNATIONAL APPLICATION NO.: PCT/JP03/03664	INTERNATIONAL FILING DATE: March 25, 2003	PRIORITY DATE CLAIMED: March 27, 2002
TITLE OF INVENTION: HEAT-RESISTANT Ti ALLOY MATERIAL EXCELLENT IN HIGH-TEMPERATURE CORROSION RESISTANCE AND OXIDATION RESISTANCE, AND PRODUCTION METHOD THEREFOR		
APPLICANT(S) FOR DO/EO/US: Toshio NARITA and Takumi NISHIMOTO		
Applicant hereby submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<ol style="list-style-type: none"> 1. <u>XX</u> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <u> </u> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <u>XX</u> This is an express request to begin national examination procedures (35 USC 371(f)). The submission must include items (5), (6), (9) and (21) indicated below. 4. <u>XX</u> The US has been elected (Article 31). 5. <u>XX</u> A copy of the International Application as filed (35 U.S.C. 371(c)(2)): <ol style="list-style-type: none"> a. <u> </u> is transmitted herewith (required only if not transmitted by the International Bureau). b. <u>XX</u> has been transmitted by the International Bureau. c. <u> </u> is not required, as the application was filed in the United States Receiving Office (RO/US) 6. <u>XX</u> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> a. <u>XX</u> is attached hereto. b. <u> </u> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <u>XX</u> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> a. <u> </u> are transmitted herewith (required only if not transmitted by the International Bureau). b. <u> </u> have been transmitted by the International Bureau. c. <u> </u> have not been made; however, the time limit for making such amendments has NOT expired. d. <u>XX</u> have not been made and will not be made. 8. <u> </u> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <u> </u> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <u> </u> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). 		
ITEMS 11. TO 20. BELOW CONCERN OTHER DOCUMENT(S) OR INFORMATION INCLUDED:		
<ol style="list-style-type: none"> 11. <u>XX</u> An Information Disclosure Statement under 37 CFR 1.97 and 1.98 together with the international search report, PTO-1449 and 7 references. 12. <u> </u> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. ASSIGNEE NAME AND ADDRESS: JAPAN SCIENCE AND TECHNOLOGY AGENCY, Kawaguchi-shi, Japan Please publish the assignee data with the application. 13. <u> </u> A preliminary amendment. 14. <u> </u> An Application Data Sheet under 37 C.F.R. 1.76 15. <u> </u> A substitute specification. 16. <u> </u> A change of power of attorney and/or address letter. 17. <u> </u> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 C.F.R. 1.821 - 1.825. 18. <u> </u> A second copy of the published international application under 35 U.S.C. 154(d)(4). 19. <u> </u> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20. <u>XX</u> Other items or information: 5 sheets of drawings. 		

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(43) 国際公開日
2003 年 10 月 2 日 (02.10.2003)

PCT

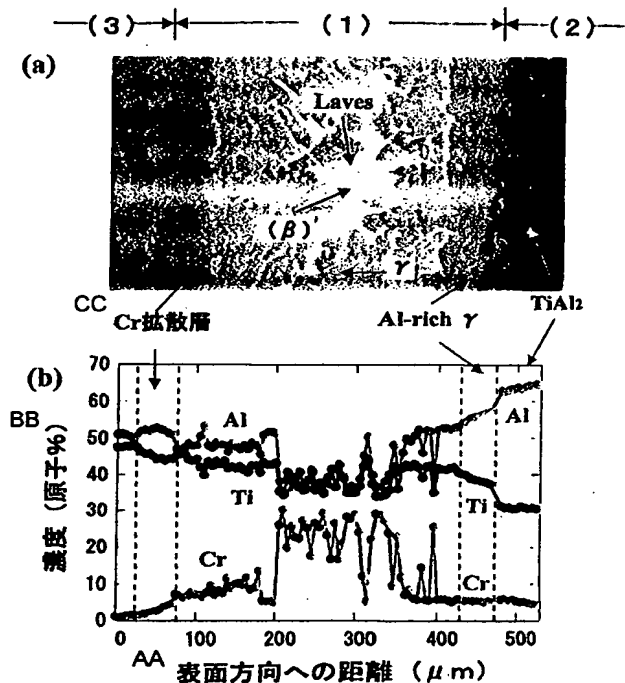
(10) 国際公開番号
WO 03/080888 A1

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|-----------------------------|---|--------------------------|--|
| (51) 国際特許分類: | C23C 10/58, C22C 14/00 | (72) 発明者; および | CORPORATION) [JP/JP]; 〒332-0012 埼玉県 川口市 本町4-1-8 Saitama (JP). |
| (21) 国際出願番号: | PCT/JP03/03664 | (75) 発明者/出願人 (米国についてのみ): | 成田 敏夫 (NARITA, Toshio) [JP/JP]; 〒001-0901 北海道 札幌市 北区新琴似1条9-7-8 Hokkaido (JP). 西本 工 (NISHI-MOTO, Takumi) [JP/JP]; 〒005-0004 北海道 札幌市 南区澄川4条4-1-10 Hokkaido (JP). |
| (22) 国際出願日: | 2003 年3 月25 日 (25.03.2003) | (74) 代理人: | 西 義之 (NISHI, Yoshiyuki); 〒235-0036 神奈川県 横浜市 磯子区中原4-26-32-211 西 特許事務所 Kanagawa (JP). |
| (25) 国際出願の言語: | 日本語 | (81) 指定国 (国内): | CN, KR, US. |
| (26) 国際公開の言語: | 日本語 | | |
| (30) 優先権データ: | | | |
| 特願2002-87738 | 2002 年3 月27 日 (27.03.2002) JP | | |
| (71) 出願人 (米国を除く全ての指定国について): | 科学技術振興事業団 (JAPAN SCIENCE AND TECHNOLOGY | | |

[続葉有]

(54) Title: HEAT-RESISTANT MATERIAL Ti ALLOY MATERIAL EXCELLENT IN RESISTANCE TO CORROSION AT HIGH TEMPERATURE AND TO OXIDATION

(54) 発明の名称: 耐高温腐食性、耐酸化性に優れた耐熱性Ti合金材料およびその製造方法



AA...DISTANCE IN DIRECTION TO SURFACE (μm)
BB...CONCENTRATION (ATOMIC %)
CC...Cr DIFFUSION LAYER

Ti-Al-Cr 系合金

(57) Abstract: A heat-resistant Ti alloy material excellent in the resistance to corrosion at a high temperature and to oxidation, characterized in that it comprises a heat-resistant Ti alloy substrate and, formed on the surface thereof, a surface layer having a double layer structure of an inner layer, wherein three phases of β -phase, γ -phase and Laves phase in the phase diagram of a Ti-Al-Cr alloy are together present, and an outer layer comprising an Al-Ti-Cr alloy, and the outer layer has an Al concentration of 50 atomic % or more; and a method for producing the heat-resistant Ti alloy material which comprises subjecting a heat-resistant Ti alloy substrate to a chromium diffusion treatment in a single β -phase region in the phase diagram of a Ti-Al-Cr alloy, allowing γ -phase and Laves phase to precipitate from the β -phase during a cooling process, to form the inner layer wherein three layers of β -phase, γ -phase and Laves phase are together present, and then subjecting the resultant product to an aluminum diffusion treatment, to form the outer layer comprising an Al-Ti-Cr alloy having an Al concentration of 50 atomic % or more. In these above heat-resistant Ti alloy material, the diffusion of Al from a protective film to the substrate and the diffusion of components of the substrate to the outer layer are prevented, and an Al_2O_3 film having a protecting action is formed in the surface portion of the outer layer and can be restored by itself, which results in the excellent resistance to corrosion at a high temperature and oxidation of the Ti alloy material.

(57) 要約: 保護皮膜から基材へのAl拡散や基材成分の外層への拡散を防止し、保護作用のある Al_2O_3 皮膜を自己修復的に形成し、優れた耐高温腐食性および耐酸化性を耐熱性Ti合金基材に付与する。

〔続葉有〕

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